

Heteroptera of the Marshall Islands

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The present report is based upon two weeks of specialized collecting by the author, mostly on Ine Island, Arno Atoll, Marshall Islands. Casual collecting by the author on Kwajalein and Majuro, en route, added two species to the list and two more were found on a brief visit to Tagelib, across the lagoon from Ine on Arno Atoll. The Arno collecting was part of a general study of the ecology of a coral atoll which was undertaken at the request of the Office of Naval Research and administered by the National Research Council through its Pacific Science Board.

The results of this study of the heteropterous Hemiptera conform to expectations in that, due to concentrated collecting, more species were found than had previously been reported from any coral atoll. Also, as was expected, the Marshall Islands collections indicate by their very nature which of the Pacific Island Heteroptera are widespread. For example, it now appears that seven species which had previously been described only from Guam, Tahiti, Hawaii or the Philippines, occur in the Marshalls and presumably will be found elsewhere in the course of future collecting. Most surprising were the marine water studies, *Halobates mariannarum* Esaki and *Halovelvia marianarum* Usinger, both of which were thought to be localized in the Marianas, but now must be recognized, with only slight variation in the structure of the male genital plate of the *Halobates*, from the Marshalls. On Arno, as on Guam, *Halobates mariannarum* was a normal inhabitant of protected coves, whereas *micans* Eschscholtz was found only when strong winds blew it up on the beach. This is similar to the behavior of *sericeus* Eschscholtz in Hawaiian waters, both of these species being normal inhabitants of the open ocean.

Two species of *Nysius* were recently recorded for the first time from the Marshalls (Usinger, Proc. Haw. Ent. Soc., 13:447, 1949). At that time it was assumed that these were war-time immigrants, *pulchellus* being known previously only from Guam and *picipes* only from Wake. Now it appears that *pulchellus* is found only on the main airport islands, e.g. Kwajalein, Majuro and Eniwetok Island. *N. picipes*, on the other hand, was found exclusively on Arno and was taken by Townes and Oakley (Usinger, loc. cit.) on Engebi, Aomon and Japtan Islands in Eniwetok Atoll. The correct interpretation of these facts must await further collecting, though the conclusion seems justified that *Nysius pulchellus* is the more recent immigrant.

The *Nysius* bugs are found on a wide variety of hosts but occur in greatest numbers in association with other Hemiptera on a sedge, *Fimbristylis cymosa*. This plant and a few weeds which are usually associated

with it, is the habitat of the largest assemblage of Hemiptera on Arno. The following species were nearly always found: *Nysius picipes*, *Ninus insignis*, *Pachybrachius pacificus*, *Pachybrachius nigriceps*, *Orthotylellus brunnescens*, and *Nabis capsiformis*.

Another type of habitat favored by Hemiptera was rotting *Pandanus* fruit. Here, preying on developing fly larvae and beetle larvae, were found *Ceratocombus hawaiiensis* and *Lasiochilus marianensis*. Two other anthocorids were found in company with *Ceratocombus*: *Physopleurella mundula* and *Poronotellus sodalis*, on the dead branches of *Scaevola* and *Messerschmidia*. Recently killed branches of these typical strand plants, with dead leaves still intact on the branches, harbored a rich fauna including small lamiine cerambycids, anobiids, an anthicid and a small, oval jumping beetle.

Table I summarizes the distributional relationships of the Heteroptera of the Marshall Islands.

Annotated List of Heteroptera of the Marshall Islands

Family Cydnidae

1. *Geotomus pygmaeus* (Dallas)

Aethus pygmaeus Dallas, List Hemipt. Brit. Mus. 1:120, 1851.

One specimen, Ine Village, June 20, at light. This was a calm evening after a full day of heavy rain.

Family Pentatomidae

2. *Oechalia consocialis* (Boisduval).

Pentatoma consociale Boisduval, Voy. Astrol., Entom., 2:630, pl. 11, fig. 9, 1835.

Majuro, June 26, common on weeds where it was preying on caterpillars. This is a widespread species and varies in size and coloration from one island group to another. The Majuro specimens are identical in appearance with specimens from Wake Island.

3. *Nysius pulchellus* Stål.

Nysius pulchellus Stål, Freg. Eugenies Resa, Ins., 244, 1859. Kwajalein, June 10, Majuro, June 11. Abundant on such low plants as *Euphorbia*, *Vernonia cinerea* and the sedge, *Fimbristylis cymosa*. Collected on *Portulaca*, Eniwetok, May 13, 1946 (Oakley).

4. *Nysius picipes* Usinger.

Nysius picipes Usinger, Proc. Haw. Ent. Soc. 9:439-441, fig., 1937. Ine Island, June 14; Abundant on many plants but in greatest numbers on *Fimbristylis cymosa*. Bryan (Usinger, *loc. cit.*) collected the original series on Wake Island on *Sesuvium*, *Cordia*, *Portulaca*, *Boerhaavia* and *Sida*. Townes took it on Japtan Island, Eniwetok Atoll on *Pisonia grandis*.

5. *Ninus insignis* Stål.

Ninus insignis Stål, Freg. Eugenies Resa., Ins., 253, pl. 3, fig. 5, 1859. Ine, June 13 and 16; Abundant in all stages of development on *Fimbristylis cymosa*. Found on other species of sedge on Guam and Luzon.

6. *Pachybrachius pacificus* (Stål).

Pamera pacifica Stål, Enum. Hemipt. 4:149, 1874. Majuro, June 11; Ine, June 18; general sweeping of grasses and sedges.

7. *Pachybrachius nigriceps* (Dallas)

Rhyparochromus nigriceps Dallas, List. Hemipt. Brit. Mus. 2:577, 1852. Ine, June 14, 16, 17, and 18; scarce; *Fimbristylis cymosa*.

Family Reduviidae

8. *Ploiaria uniformis* McAtee and Malloch

Ploiaria uniformis McAtee and Malloch, Philippine Jour. Sci., 30:142-3, fig. 45, 1926. Ine, June 13 and 17. Found amidst loose sheaths on the trunks of coconut.

Family Nabidae

9. *Nabis capsiformis* Germar

Nabis capsiformis Germar, Silberman's Rev. Ent. 5:132, 1837. Kwajalein, June 11; Ine, June 14 and 17. Abundant in all stages on *Fimbristylis*, grasses and weeds preying upon lygaeids and other small insects.

Family Anthocoridae

10. *Lasiochilus marianensis* Usinger

Lasiochilus marianensis Usinger, Bishop Mus. Bull. 189:52, 1946. Ine, June 16 and 20. Found in company with *Ceratocombus* in fallen, rotting *Pandanus* fruit.

11. *Physopleurella mundula* (White)

Cardiastethus mundulus White, Ann. Mag. Nat. Hist. (4) 20:111, 1877. Ine, June 17; beating dead leaves and branches of *Scaevola*.

12. *Poronotellus sodalis* (White)

Cardiastethus sodalis White, Ann. Mag. Nat. Hist. (5) 1:372, 1878. Ine, June 17 and 21; beating dead leaves and branches of *Scaevola*.

Family Miridae

13. *Trigonotylus brevipes* Jakowlef

Trigonotylus brevipes Jakowlef, Horae Soc. Ent. Ross., 11:63, 1880. Ine, June 13 and 14; abundant in all stages on grasses.

14. *Orthotylellus brunnescens* Usinger

Orthotylellus brunnescens Usinger, Bishop Mus. Bull. 189:81, 1946. Ine, June 14, 16, 17 and 18; abundant on *Fimbristylis cymosa*. On the

basis of present evidence this is regarded as a widespread, exceedingly variable species. Pale forms and dark forms were taken on the same plants, some specimens being more densely pubescent than others. The same sort of variation occurs in a series which I collected at Montalban, Luzon, P. I., July 14, 1936 and one of the Luzon specimens is exactly like the dark Ine form. Guam specimens are more pubescent than the average for the Arno series but all specimens including those from the Philippines agree in such essential characters as antennal and rostral lengths, antennal proportions and male genital claspers (no Guam males were available). *O. samoanus* Knight, which also varies in color (e.g. var. *nigrellus* Knight) differs in that the second antennal segment is more than half again as long as the third (at least in the female) (65::39 in *samoanus*; 23::17 in *brunnescens*), the last segment is distinctly shorter than third (28::39 in *samoanus*; 16::17 in *brunnescens*), and the rostrum is longer (reaching the eighth ventral segment in *samoanus*; sixth segment in *brunnescens*).

15. *Halticus tibialis* Reuter

Halticus tibialis Reuter, Rev. d'Ent., 10:135, 1891.

Ine, June 14 and 17; abundant on *Vigna mariana*?. This species was recorded by Esaki as injurious to beans in the Carolines. It occupies the same habitat as *insularis* Usinger on Guam but has darker legs with the basal half of hind tibiae infusate. The specimens from Amboina and Macassar which I identified as *tibialis* (Usinger, Bishop Mus. Bull. 189:86, 1946) have shorter antennae and may prove to be *Halticus minutus* Reuter. All three of the above species show slight differences in male genitalia.

16. *Campylomma tahitica* Knight

Campylomma tahitica Knight, Bishop Mus. Bull. 142:191, 1938.

Kwajalein, June 10. Judging by the number of endemic species on Guam and in the Marquesas, speciation must be relatively rapid in this group. Consequently, it serves no useful purpose to lump species under such old and ill-defined names as *livida* Reuter, originally described from Bengal and subsequently reported from Australia and Formosa. On the other hand it seems equally fallacious to assume that a species is new, simply because it occurs on a different island. The present specimen is closest to a specimen which I collected at Laguna de Bay, Luzon, P. I., July 19, 1936 and to a specimen from Macao, China, 1906 (F. Muir) but differs in minor details from each of these. It does not agree with Reuter's description of *lividicornis* from Luzon. It runs to *adamsoni* Knight in the key to Marquesan species (Knight, Bishop Mus. Bull. 142:181, 1938) but differs in femoral maculation. It agrees perfectly with Knight's description of *tahitica*, except that it has fuscous spots on the first antennal segment and fuscous at the extreme base of the second segment. These differences are too trivial to warrant the description of a new species.

Family Cryptostemmatidae

17. *Ceratocombus hawaiiensis* Usinger

Ceratocombus hawaiiensis Usinger, Proc. Haw. Ent. Soc., 12:633, 1946. Ine, June 16 and 20; abundant in rotting *Pandanus* fruit. Zimmerman (Insects of Hawaii, 3:180, fig. 76, 1948) expresses the opinion that this species is an immigrant to the Hawaiian fauna. The present record from the Marshalls suggests that this inference may be correct. On the other hand, it is not yet clear what characters are significant at the species level in the subgenus *Xylonannus*. Suffice it to say that the Arno specimens, although variable as to size and degree of wing development, agree with a female paratype of *hawaiiensis* in general appearance and proportions of antennal segments and rostrum. Furthermore, they do not agree with the descriptions of the other Old World species of *Xylonannus*, e.g. *corticalis* Reuter from Europe, *enderleini* Poppius from Africa, *taivanus* Poppius from Formosa, *australiensis* Gross from Australia and *toda* Hutchinson from India.

Family Gerridae

18. *Halobates micans* Eschscholtz

Halobates micans Eschscholtz, Entomographien, 1:109, Table 2, fig. 5, 1822.

Kwajalein, June 11; Ine, June 15; blown up on the beach in large numbers. On Ine the lagoon side was the windward side and the bugs were found during heavy winds clinging to slight depressions or foot prints in the sand. The bugs were gradually blown farther up the beach, as much as 15 or 20 feet. A shore bird was seen feeding on them and the ghost crabs and hermit crabs, scavengers of the beach, are probably responsible for cleaning up the bulk of the specimens. Females outnumbered the males, 2 to 1.

19. *Halobates mariannarum* Esaki

Halobates mariannarum Esaki, Tenthredo, 1:357, pl. 31, fig. 1 & 2, 1937. Tagelib, June 19; found cruising individually in a protected cove on the windward (ocean) side of the island. The sex ratio in this local species was even more disproportionate than in the case of *micans*, 5 males and 40 females being taken. No eggs were seen, although a careful search was made of floating feathers. The bugs were never collected in the act of feeding and there were no obvious plankton organisms at or near the surface of the pool. The tide was extremely low during the collecting period, 10 a.m. to 3 p.m. The present series differs from typical Guam specimens in that the dorsal plate of the male genitalia (ninth segment) is relatively broader. All other characters appear to be identical in the two series.

Family Veliidae

20. *Halovelis marianarum* Usinger

Halovelis marianarum Usinger, Bishop Mus. Bull. 189:98, 1946.
Tagelieb, June 19; Majuro, June 26. Found in groups of half a dozen to fifty or more, swimming near shore in the same protected pool as *Halobates mariannarum* and also in tide pools on Majuro. In most cases the small male was riding on the back of the female, whether in copulation or not.

Table 1.—Distributional relationships of the Heteroptera of the Marshall Islands.

Marshall Islands	Guam	Philippines	Samoa	Hawaii	Other Localities
Family Cydnidae 1. <i>Geotomus pygmaeus</i> (Dallas)	x	x	x	x	Line Islands, Society Is. Oriental Region
Family Pentatomidae 2. <i>Oechalia consocialis</i> (Boisd.)					Australia, Tasmania, New Zealand, Fiji, Line Is., Wake, Rapa, Pitcairn, Society Is., Tuamotus, Australs, Marquesas, Mangareva
Family Lygaeidae 3. <i>Nysius pulchellus</i> Stål	x				
4. <i>Nysius picipes</i> Usinger					Wake Is.
5. <i>Ninus insignis</i> Stål	x	x			Ceylon, Java, Philippines
6. <i>Pachybrachius pacificus</i> (Stål)	x		x		Fiji, Society Is. Australia, Tuamotus, Mangareva, Carolines
7. <i>Pachybrachius nigriceps</i> (Dallas)	x	x	x	x	Society Is., New Zealand, Australia
Family Reduviidae 8. <i>Ploiaria uniformis</i> M. & M.		x			
Family Nabidae 9. <i>Nabis capsiformis</i> Germar	x	x	x	x	Tropicopolitan
Family Anthcoridae 10. <i>Lasiqchilus marianensis</i> Usinger	x				
11. <i>Physopleurella mundula</i> (White)	x			x	
12. <i>Poronotellus sodalis</i> (White)	x			x	
Family Miridae 13. <i>Trigonotylus brevipes</i> Jak.	x	x	x		Nearly cosmopolitan
14. <i>Orthotylellus brunnescens</i> Usinger	x	x			
15. <i>Halticus tibialis</i> Reuter					Java, Ceylon, Africa, Carolines (?)
16. <i>Campylomma tahitica</i> Knight					Tahiti
Family Cryptostemmatidae 17. <i>Ceratocombus hawaiiensis</i> Usinger				x	
Family Gerridae 18. <i>Halobates micans</i> Esch.					Atlantic, Pacific and Indian Oceans, Palmyra, Formosa, Marquesas, Galapagos
19. <i>Halobates mariannarum</i> Esaki	x				
Family Veliidae 20. <i>Halovelia marianarum</i> Usinger	x				